PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-256275

(43)Date of publication of application : 01.10.1996

(51)Int.Cl. H04N 1/60
B41J 2/525
G09G 5/00
G09G 5/02
G09G 5/06
G09G 5/36
H04N 1/46
H04N 9/79

(21)Application number : 08-003779 (71)Applicant : BROTHER IND LTD

(22)Date of filing : 12.01.1996 (72)Inventor : UEDA MASASHI

(30)Priority

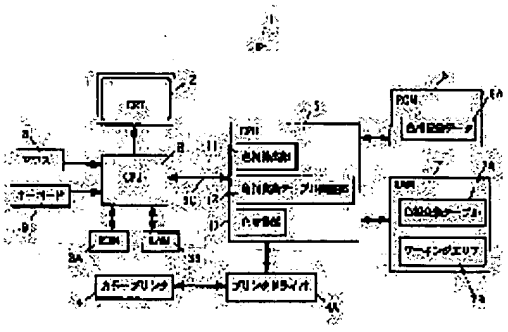
Priority number : 07 21043 Priority date : 12.01.1995 Priority country : JP

(54) COLOR IMAGE SIGNAL PROCESSING METHOD AND DEVICE USING THE METHOD

(57)Abstract:

PURPOSE: To easily realize proper color reproduction by selecting a color of an image signal reproduced by a device and correcting a conversion characteristic of a hue based on the selected color and a color reproduced by another device.

CONSTITUTION: A print instruction by a color printer (2nd device) 4 as to color image data displayed on a color CRT display device (1st device) is sent from a CPU 3 to a CPU 5 and a signal is given to the CPU 5 to adjust a hue conversion table 7A of a RAM 7, the CPU 5 gives a signal to obtain color selection on the CRT 2 to the CPU 3. When the user selects a color to be adjusted from an image on the CRT 2, the CPU 3 transfers the selected color data to the CPU 5. When the user enters a hue adjustment amount, the CPU 3 transfers it to the CPU 5 and a hue conversion table



adjustment section 12 of the CPU 5 corrects data in a hue conversion table 7A based on the selected color data and the hue adjustment value.

LEGAL STATUS

[Date of request for examination]	25.12.1997
[Date of sending the examiner's decision of rejection]	20.08.2002
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	
[Date of registration]	
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] In the color-picture-signal processor equipped with a hue calculation means to compute a hue value from the chrominance signal of the image reproduced with the 1st device, and a hue conversion means to change in order to reproduce the hue value computed by said hue calculation means with the 2nd device The 1st colour selection means which chooses the color of the picture signal reproduced with the 1st device, It is based on the color chosen by the 2nd colour selection means which chooses the color reproduced with the 2nd device, and said 1st colour selection means, and the color chosen by said 2nd colour selection means. The color-picture-signal processor characterized by having a transfer characteristic correction means to correct the transfer characteristic of said hue conversion means.
[Claim 2] Said hue conversion means is equipped with a hue conversion value storage means by which set up beforehand the hue value of the 1st device which divided the hue range of the 1st device into arbitration, and the hue value of the 2nd device corresponding to it, and they were memorized. An address calculation means to compute the address in said hue conversion value storage means based on the color as which said transfer characteristic correction means was chosen by said 1st colour selection means, A hue transfer characteristic calculation means to compute the new transfer characteristic based on the color chosen by said 1st colour selection means and said 2nd colour selection means, The color-picture-signal processor according to claim 1 characterized by having a hue conversion value correction means to correct the contents of storage of said hue conversion value storage means, based on the address computed by said address calculation means, and the new transfer characteristic computed by said hue transfer characteristic calculation means.
[Claim 3] The storage capacity of said hue conversion value storage means is a color-picture-signal processor according to claim 2 characterized by being adjustable.
[Claim 4] Said 2nd colour selection means is a color-picture-signal processor given in either of claim 1 to claims 3 characterized by choosing the value which shows the amount of adjustments of the hue about the color chosen with said 1st colour selection means.
[Claim 5] In the color-picture-signal art changed in order to compute a hue value from the chrominance signal of the image reproduced with the 1st device and to reproduce the computed hue value with the 2nd device The 1st selection stage story which chooses the color of the picture signal reproduced with the 1st device, The color-picture-signal art characterized by including the transfer characteristic correction phase of correcting the transfer characteristic at the time of performing said conversion, based on the color chosen on the 2nd selection stage story which chooses the color reproduced with the 2nd device, and said 1st selection stage story, and the color chosen on said 2nd selection stage story.
[Claim 6] In the color-picture-signal art changed in order to compute a hue value from the chrominance signal of the image reproduced with the 1st device and to reproduce the computed hue value with the 2nd device The 1st selection stage story which chooses the color of the picture signal reproduced with the 1st device, It is based on the color chosen on the 2nd selection stage story which chooses the color reproduced with the 2nd device, and said 1st selection stage story. The address calculation phase which computes the address of a hue conversion value storage means by which set up beforehand the hue value

of the 1st device which divided the hue range of the 1st device into arbitration, and the hue value of the 2nd device corresponding to it, and they were memorized, The hue transfer characteristic calculation phase which computes the new transfer characteristic based on the color chosen by said 1st selection stage story and said 2nd selection stage story, The color-picture-signal art characterized by including the hue conversion value correction phase of correcting the contents of storage of said hue conversion value storage means, based on the address computed by said address calculation phase and the new transfer characteristic computed by said hue transfer characteristic calculation phase.

[Claim 7] A color-picture-signal art given in either claim 5 characterized by choosing the value which shows the amount of adjustments of the hue about the color chosen on said 1st selection stage story on said 2nd selection stage story, or claim 6.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the equipment which used the color-picture-signal art and it which change a chrominance signal, in order to reproduce the chrominance signal of the 1st device, for example, the image for color CRTs, with the 2nd device, for example, a color printer etc.
[0002]
[Description of the Prior Art] Conventionally, when the chrominance signal was described by 8 bits in each device in the color-picture-signal processor which changes the RGB (Red Green Black) signal for the color CRTs as the 1st device into the signal of CMYK (cyanogen Magenta yellow and Japanese ink) which is the control signal of the color printer as the 2nd device, it was common to have carried out transform processing as follows. That is, although it thought that three signals of CMY were the complementary color of RGB, it changed by C=255-R, M=255-G, and the formula Y=255-B Becoming and many things were proposed about calculation of K which is Japanese ink, it was common to have applied the minimum value of CMY each signal.
[0003] However, the color correction and color conversion which could not become a thing corresponding to a user's color sensation easily in color-picture-signal processing for the numeric value depending on such each device, and agreed in consciousness were difficult. Furthermore, although most objects of color correction or color conversion were adjustments of a hue, in the chrominance signal of RGB or CMYK, the color reproduced is dependent on the device, and it could not change into exact hue data, and proper transfer was not able to be performed.
[0004] The policy which cancels such a trouble is proposed in JP,63-48990,A, JP,4-44277,B, etc. By these proposals, the point that most objects of color correction are corrections of a hue is noted. Are not an RGB code, do not say that color correction is made by three signals of HVC (a hue, lightness, and saturation), and as international standards independent of a device further By receiving the signal based on a CIE (Commission Internationale de l'Eclairage or International Commission on Illumination) system It is going to solve the problem by the color reproduction depending on a device property. In this CIE, as an approach of expressing a color numerically, the XYZ color system (this value of XYZ is hereafter called "CIE1931XYZ value".) was enacted in 1931, and the L*a*b* color coordinate system (the value of this L*a*b* is hereafter called "CIE1976 L*a*b* value".) is enacted in 1976.
[0005]
[Problem(s) to be Solved by the Invention] However, these conventional approaches cannot but be color matching with the color value of a CIE system to the last, and are not the things even corresponding to the consciousness-difference in the vanity of the color resulting from the difference in the mechanism of the color mixture of the color reproduction of the additive-mixture-of-colors system by coloring like CRT, and the color reproduction of the subtractive-color-mixture system by ink color material like a printer. Moreover, although the color (the so-called memory color) of flesh color, empty, grass, etc. may serve as color reproduction with better reproducing an actual color and a different color, since it is that to which the conventional color conversion approach aims at an equal color numerically to the last to

such a color, proper correspondence has not been performed.
[0006] In case the chrominance signal of the image which is made in order that this invention may solve the trouble mentioned above, and is reproduced with the 1st device is reproduced with the 2nd device Among the three attributes of a color, [occupying the important location in color reproduction], color matching of a hue aims at offering the color-picture-signal processor which made proper color reproduction possible easily, as a user can change into the desired hue transfer characteristic.
[0007]
[Means for Solving the Problem] In order to attain this purpose a color-picture-signal processor according to claim 1 A hue calculation means to compute a hue value from the chrominance signal of the image reproduced with the 1st device, The 1st colour selection means which chooses the color of the image which is the color-picture-signal processor equipped with a hue conversion means to change in order to reproduce the hue value computed by the hue calculation means with the 2nd device, and is reproduced with the 1st device, Based on the color chosen by the 2nd colour selection means which chooses the color reproduced with the 2nd device, and the 1st colour selection means, and the color chosen by the 2nd colour selection means, it has a transfer characteristic correction means to correct the transfer characteristic of a hue conversion means.
[0008] Thus, in the constituted color-picture-signal processor according to claim 1, a hue calculation means computes a hue value from the chrominance signal of the image reproduced with the 1st device, and a hue conversion means is changed in order to reproduce the computed hue value with the 2nd device. A user chooses the color of the image reproduced by the 1st colour selection means with the 1st device, and chooses the color of the request reproduced by the 2nd colour selection means with the 2nd device. Based on the color as which these both were chosen, a transfer characteristic correction means corrects the transfer characteristic of a hue conversion means. If the transfer characteristic is corrected, it will once enable henceforth the color of the request chosen with the 2nd colour selection means to reappear in the 2nd device about the color chosen with the 1st colour selection means.
[0009] Moreover, a color-picture-signal processor according to claim 2 A hue conversion means is equipped with a hue conversion value storage means by which set up beforehand the hue value of the 1st device which divided the hue range of the 1st device into arbitration, and the hue value of the 2nd device corresponding to it, and they were memorized, in a color-picture-signal processor according to claim 1. A transfer characteristic correction means An address calculation means to compute the address in a hue conversion value storage means based on the color chosen by the 1st colour selection means, A hue transfer characteristic calculation means to compute the new transfer characteristic based on the color chosen by the 1st colour selection means and the 2nd colour selection means, Based on the address computed by the address calculation means, and the new transfer characteristic computed by the hue transfer characteristic calculation means, it has a hue conversion value correction means to correct the contents of storage of a hue conversion value storage means.
[0010] thus, the constituted color-picture-signal processor according to claim 2 -- if it is, a hue conversion means carries out interpolation calculation of the hue value based on the information memorized by the hue conversion value storage means. Based on the color chosen by the 1st colour selection means, a transfer characteristic correction means computes the address in a hue conversion value storage means, computes the new transfer characteristic based on the color chosen by the 1st colour selection means and the 2nd colour selection means, and corrects the contents of storage of a hue conversion value storage means based on the computed address and the new transfer characteristic. Thereby, it enables a hue conversion means to carry out calculation interpolation of the hue value using the hue conversion value storage means corrected to a new value according to a user's selection.
[0011] Moreover, in a color-picture-signal processor according to claim 2, a color-picture-signal processor according to claim 3 is constituted so that the storage capacity of a hue conversion value storage means may be adjustable, and it can develop the transfer characteristic of a wish of a user.
[0012] Moreover, in a color-picture-signal processor given in either of claim 1 to claims 3, the 2nd colour selection means is constituted as what chooses the value which shows the amount of adjustments of the hue about the color chosen with the 1st colour selection means, and a color-picture-signal

processor according to claim 4 can perform selection in alignment with a user's sensibility.
[0013] Moreover, the color-picture-signal approach according to claim 5 is set to the color-picture-signal art changed in order to compute a hue value from the chrominance signal of the image reproduced with the 1st device and to reproduce the computed hue value with the 2nd device. The 1st selection stage story which chooses the color of the picture signal reproduced with the 1st device, It is based on the color chosen on the 2nd selection stage story which chooses the color reproduced with the 2nd device, and the 1st selection stage story, and the color chosen on the 2nd selection stage story. It is constituted so that the transfer characteristic correction phase of correcting the transfer characteristic at the time of performing said conversion may be included, and if the transfer characteristic is corrected, according to the correction, it will once enable a desired color to reappear in the 2nd device henceforth.
[0014] Moreover, the color-picture-signal approach according to claim 6 is set to the color-picture-signal art changed in order to compute a hue value from the chrominance signal of the image reproduced with the 1st device and to reproduce the computed hue value with the 2nd device. The 1st selection stage story which chooses the color of the picture signal reproduced with the 1st device, It is based on the color chosen on the 2nd selection stage story which chooses the color reproduced with the 2nd device, and the 1st selection stage story. The address calculation phase which computes the address of a hue conversion value storage means by which set up beforehand the hue value of the 1st device which divided the hue range of the 1st device into arbitration, and the hue value of the 2nd device corresponding to it, and they were memorized, The hue transfer characteristic calculation phase which computes the new transfer characteristic based on the color chosen by the 1st selection stage story and the 2nd selection stage story, It is constituted so that the hue conversion value correction phase of correcting the contents of storage of a hue conversion value storage means may be included based on the address computed by the address calculation phase and the new transfer characteristic computed by the hue transfer characteristic calculation phase. It becomes possible to carry out calculation interpolation of the hue value by this using the hue conversion value storage means corrected to a new value according to a user's selection.
[0015] Moreover, a color-picture-signal art according to claim 7 is constituted as what chooses the value which shows the amount of adjustments of the hue about the color chosen as either claim 5 or claim 6 on the 1st selection stage story by the 2nd selection stage story in the color-picture-signal art of a publication, and can perform selection in alignment with a user's sensibility.
[0016]
[Embodiment of the Invention] Hereafter, the gestalt of the operation which materialized this invention is explained with reference to a drawing.
[0017] Drawing 1 shows the whole color-picture-signal processor (henceforth this equipment) configuration by the gestalt of this operation, changes the chrominance signal of the image reproduced on the color CRT display 2 as the 1st device, and reproduces it in the color printer 4 as the 2nd device.
[0018] CPU3 to which this equipment 1 outputs the chrominance signal of the image to CRT display 2, RAM3B which memorizes signals, such as image information which the signal inputted into ROM3A which memorized the control program of CPU3 etc., and CPU3, and CPU3 output, etc., It consists of CPU5 which carries out transform processing of the chrominance signal, and is outputted to a color printer 4 through printing driver 4A, ROM6 hue translation data 6A and a program were remembered to be, and RAM7 in which hue translation table 7A, working area 7B, etc. were prepared. The mouse 8 and keyboard 9 for inputting operator command into CPU3 are connected, it connects in bus 3C and CPU3 and CPU5 are in the condition which can be communicated. ROM6 and RAM7 are connected to CPU5. Moreover, CPU5 has the functional configuration of the hue calculation section 11 (hue calculation means), the hue translation table controller 12 (transfer characteristic correction means), and the color transducer 13 (hue conversion means) by the program stored in ROM6.
[0019] Next, actuation of this equipment 1 which becomes with the above-mentioned configuration is explained. First, the usual actuation is explained.
[0020] If the printing instruction for performing printing by the color printer 4 is sent out to CPU3 to CPU5 about the color picture data displayed on CRT display 2, when the address of hue translation table

7A of RAM7 is searched and data do not exist in hue translation table 7A, CPU5 will call ROM6 to hue translation data 6A, and will write this in the predetermined field of RAM7. Then, image data is sent to the hue calculation section 11 of CPU3 to CPU5, and a hue value is computed from the chrominance signal in image data here. Furthermore, this hue value is changed in order to reappear by the printer in the color transducer 13. Conversion by the color transducer 13 is performed referring to hue translation table 7A memorized by RAM7. CPU5 controls a color printer 4 through printing driver 4A based on the data after conversion, and prints an image.

[0021] Next, the actuation adjusted so that hue translation table 7A memorized by RAM7 may be doubled with liking of a user is explained. A printing instruction is sent to CPU5 via bus 3C from CPU3, and if CPU5 checks that data exist in hue translation table 7A of RAM7, CPU5 will send the signal which asks whether hue translation table 7A is adjusted to CPU3. The signal of this question is displayed by CPU3 on CRT display 2. This question is always performed also in the above-mentioned normal operation. A user inputs into CPU3 whether a mouse 8 or a keyboard 9 is operated and hue translation table 7A is adjusted to this question. The signal of the response is returned to CPU5 through bus 3C from CPU3.

[0022] Here, when the signal which adjusts hue translation table 7A is inputted into CPU5, CPU5 sends the signal which asks for selection of the color which performs hue adjustment on CRT display 2 to CPU3 through bus 3C. CPU3 performs the display which asks for selection of the color which performs hue adjustment on CRT2. A user chooses the color which it is going to adjust out of the image which operates a mouse 8 or a keyboard 9, for example, is displayed on CRT display 2, and inputs into CPU3. If colour selection is decided, CPU3 will transmit the color value data (chrominance signal) displayed on selected CRT display 2 to CPU5 through bus 3C. The hue translation table controller 12 of CPU5 receives the transmitted color value data. The above configuration and processing are equivalent to the 1st colour selection means.

[0023] Next, CPU5 sends the signal it is directed that sends the amount of hue adjustments to CPU3 through bus 3C. This amount of hue adjustments is to reproduce a desired color by the color printer 4 about the color chosen above. A user operates a mouse 8 or a keyboard 9, inputs the amount of hue adjustments into CPU3, and transmits this inputted amount of hue adjustments to CPU5 through bus 3C from CPU3. The hue translation table controller 12 of CPU5 receives the transmitted amount of hue adjustments. The above configuration and processing are equivalent to the 2nd colour selection means. And the hue translation table controller 12 corrects hue translation table 7A based on the color value data and the amount of hue adjustments which were chosen as mentioned above, and changes the data of hue translation table 7A in RAM7.

[0024] Then, the actuation mentioned above is explained more to a detail. The following explanation carries out hue conversion of the CIE1931XYZ value outputted from CPU3, and makes the example the thing which changes into a new CIE1931XYZ value, changes into a CMYK signal and is further inputted into print head driver 4A with the CMY transformation method of common knowledge of the new CIE1931XYZ value and to perform on the so-called device-independent color system.

[0025] First, before detailed explanation requires, the transformation which changes a CIE1931XYZ value into a HVC (H: hue, V:lightness, C:saturation) value is explained.

[0026] The tristimulus value (signal value) in the CIE1931XYZ color specification method of the white of a CRT display is set to Xn, Yn, and Zn, respectively. Moreover, the tristimulus value (signal value) in the CIE1931XYZ color specification method of the color of the arbitration of the image for CRT display 2 outputted from CPU3 is set to X, Y, and Z. L* a* b* based on the CIE1976L* a* b* color coordinate system from these data A value is computed based on a bottom type.

[0027]

[Equation 1]

$L^* = 116 (Y/Yn)(1/3) - 16$ $a^* = 500 \{(X/Xn)(1/3) - (Y/Yn)(1/3)\}$

$b^* = 200 \{(Y/Yn)(1/3) - (Z/Zn)(1/3)\}$

However, the term of the cubic root which corresponds when (X/Xn), (Y/Yn) or, and (Z/Zn) is 0.008856 or less is 7.787+(X/Xn) 16/116, 7.787+(Y/Yn) 16/116, and 7.787+(Z/Zn) 16/116. It changes. Namely,

"(1 (X/Xn)/3)" is set to "7.787 +(X/Xn) 16/116" at the time of <=(X/Xn) 0.008856, for example.
[0028] Next, the following formulas are used for changing this into HVC.
[0029]
[Equation 2] H0 =ARCTAN(b*/a*) x180 / pia* > At the time of 0 and b* >=0 At the time of H=H0a* <0 and b* >=0 H=180-H0a* > At the time of 0 and b* <=0, at the time of H=H0+180a* <0 and b* <=0 Although it is colorless at the time of H= 270 and a* =0, and b* =0 at the time of H=90a* =0 and b* <0 and is white, black, and a color with the value of only the lightness which does not have a concept of a hue like gray at the time of H=360-H0a* =0 and b* >0, they are H= 0 and ******** for convenience.
[0030] Detailed explanation is given with reference to the system which connects V=L*C= (a*2-b*2) (1/2), next CRT display 2 and color printer 4 of a gestalt of this operation.
[0031] With the gestalt of this operation, the data transfer between devices is performed by the CIE1931XYZ color specification method (it is said the following and "it is XYZ about the value in this color specification method".) which is one of the color specification technique independent of the device called so-called device-independent color.
[0032] First, with reference to drawing 1 and drawing 2 , it explains that general color conversion flows.

[0033] If an input value XYZin is inputted into CPU5 through bus 3C from CPU3 (S1), an input value XYZin will be changed into a L*a*b*in value according to the several 1 above-mentioned transformation in the hue calculation section 11 of CPU5, and, subsequently a L*a*b*in value will be changed into the input hue value Hin in the hue calculation section 11 according to several 2 formula (S2). Next, the color transducer 13 calls the output hue value Hout corresponding to this input hue value Hin, when the value applicable to the hue value Hin judges whether it memorizes as an input hue value and is memorized in it with reference to hue translation table 7A of RAM7, and when not memorizing, it carries out prediction calculation of the output hue value Hout by the below-mentioned interpolation approach (S3). Subsequently, based on the calculated hue value Hout and said L*a*b*in value, a L*a*b*out value is computed according to several 3 formula shown below.
[0034]
[Equation 3]
L*out =L*in a*out =Cos x (1/2) (Hout xpi/180) (a*in2+b*in2) b*out =Sin x (1/2) (Hout xpi/180) (a*in2+b*in2) Next, based on said L*a*b*out value, a XYZout value is computed according to several 4 formula shown below (S4).
[0035]
[Equation 4] Y0 = (L*out +16) / 116X0 =a*out /500+Y0Z0 =Y0-b*out /200Xout =X03xXnYout =Y03xYnZout =Z03xZn -- however X0, Y0, and Z0 Either (1 (0.008856)/3) In the following cases, it is corresponding XYZout. It is computed from the following formula.
[0036] 7.787Zout = [Xout = (X0-16/116) / 7.787Yout = (Y0-16/116) /] (Z0-16/116)/7.787 -- subsequently to a CMY value, a XYZout value is changed by CMY conversion of common knowledge by the color transducer 13 (S5). And the signal of a CMY value is transmitted to the printer print head 4 through print head driver 4A through CPU5 to bus 5A, and print reappearance of the image is carried out.
[0037] Then, the interpolation approach mentioned above is explained with reference to drawing 3, drawing 4 , and drawing 5 . And it graph-izes an output hue value for an axis of ordinate. [drawing 3] [the input hue value described by hue translation table 7A] [for an axis of abscissa] Drawing 4 R> 4 shows the example value memorized by hue translation table 7A. in addition -- although the input hue value and the output hue value are drawn in 0-360, if the graph range of drawing 3 and the range of the hue value described by hue translation table 7A of drawing 4 include the hue range of 0-360 -- positive/negative -- it is inoffensive whichever it has exceeded in the direction of. In addition, it is because a hue is expressed by the hue circle that the range of a hue value is 0 to 360 here.
[0038] If the input hue value Hin considers as the hue value given to the color transducer 13, the output hue value Hout changed will be calculated as follows. Input hue value Hin1 which hits before and after the input hue value Hin from hue translation table 7A Hin2 It searches and the output hue values Hout1

and Hout2 corresponding to this are calculated further. Then, Hout is computed by the following type.
[0039]
[Equation 5]
Hout=(Hin-Hin1)/(Hin2-Hin1) x(Hout2-Hout1)+Hout1 drawing 5 shows interpolated hue translation table 7A. The above is explanation of the art which changes into the XYZout value for color printer 4 the XYZin value for CRT display 2 outputted from CPU3.
[0040] Then, the correction approach of hue translation table 7A which is the description of this invention is explained with reference to drawing 6 .
[0041] First, if the color which a user wants to correct in the color displayed on CRT display 2 using the mouse 8 or the keyboard 9 is shown, CPU3 will read the XYZ value in RAM3B which is the image information corresponding to the directed location, and will input the XYZ value into CPU5 through bus 3C (S11). The hue calculation section 11 of CPU5 reads the selected XYZ value, and computes the hue value Hin based on several 1 formula and several 2 formula (S12). The color transducer 13 carries out interpolation calculation of the output hue value Hout corresponding to Hin using several 5 formula as mentioned above, when whether the same value as this Hin is memorized by the input hue value of hue translation table 7A judges (S13) and it is not memorized (S14). Furthermore, the address 2 (n+1) of Hin2 on hue translation table 7A of RAM7 is rewritten, and it memorizes to working area 7B of RAM7 as the address, and an insert mode is set to ON and this is memorized to working area 7B of RAM7 (S15).
[0042] Then, if CRT display 2 and a mouse 8, or a keyboard 9 is used and the amount of adjustments of a hue is chosen in order to show how a user want to change [this selected color] compared with old color conversion, CPU3 responds to that amount of adjustments, and is the output hue Hout. Amount of color tone ready **H is computed, and it inputs into CPU5 (S16). The hue translation table controller 12 adjusts the value of Hout according to an input value Hin in response to this amount of color tone ready **H, and calculates the value of Hout as a new conversion value (S17). In addition, various idea **** give various indication of the color for selection of the amount of adjustments, and you may make it choose the input approach of the amount of color tone ready of said output hue Hout from the (for example, for the scale showing extent of "making it reddish" and "making it bluish" to be displayed, and for the degree to be chosen.) displayed color by the mouse 8 or the keyboard 9 for example, on CRT display 2. Moreover, you may make it input a hue value as a direct numeric value from the keyboard 9 connected to CPU3.
[0043] Subsequently, when ON of the insert mode memorized by working area 7B of RAM7 and OFF are investigated (S18) and it is turned on, the hue translation table controller 12 Inserting the new data Hin and Hout in the location of the address on hue translation table 7A applicable to 2 (n+1) which rewrote to working area 7B of RAM7, and was memorized as the address, (S19) the data after Hin2 move to two address [every] back (refer to drawing 5).
[0044] Moreover, in the case of the same value as either of the input hue values Hin(s) were remembered to be by hue translation table 7A, (S13) and a corresponding output hue value are read, and it is Hout about this. It carries out (S20). Furthermore, the address on hue translation table 7A of the input hue value the same value as Hin is remembered to be is rewritten, and it memorizes to working area 7B of RAM7 as the address, and an insert mode is set to OFF, this is memorized to working area 7B of RAM7 (S21), and they are after that and Hout. It adjusts like the above-mentioned processing (S16, S17). Then, they are Hin and Hout to the order from the location which was memorized by work-piece king area 7B since the insert mode memorized by working area 7B was OFF (S18, NO) and which rewrote and was shown in the address. A value is overwritten (S22).
[0045] Thus, by using hue translation table 7A which corrected the transfer characteristic, it becomes possible to carry out color conversion of the color which the user aimed at according to liking of a user. Furthermore, since it is delicately adjusted so that the color near [which added correction] Hin may also hold a continuity by new hue translation table 7A to which the input hue Hin and the output hue Hout were added, generating of a jump of the reappearance color by having corrected this hue translation table 7A can be prevented. In addition, although this example explains the example of color

---

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the color-picture-signal processor by one example of this invention.
[Drawing 2] It is the flow chart which shows processing of the color conversion in this equipment.
[Drawing 3] It is drawing explaining the interpolation approach in hue conversion.
[Drawing 4] It is drawing showing the contents of the hue translation table before correction.
[Drawing 5] It is drawing showing the contents of the hue translation table after correction.
[Drawing 6] It is the flow chart which shows the procedure of correction processing of a hue translation table.
[Description of Notations]
1 Color-Picture-Signal Processor
2 CRT Display
3 CPU
5 CPU
7A Hue translation table
8 Mouse
9 Keyboard
11 Hue Calculation Section
12 Hue Translation Table Controller
13 Color Transducer

[Translation done.]

conversion in a device-independent color like a CIE1931XYZ color specification method in detail, it is possible to apply by adding a color conversion means as shown in JP,63-162248,A between a device color and the color-picture-signal processor of this invention also to the device which outputs and inputs RGB which is a device color, and CMYK.

[0046]

[Effect of the Invention] Since the hue transfer characteristic is [like / it is ****** from having explained above and] correctable based on selection with the color inputted from the 1st device, and the color reproduced with the 2nd device according to the color-picture-signal processor according to claim 1, or he wishs, in the 2nd device, the color suitable for consciousness which is a user is easily reproducible.

[0047] Moreover, since according to the color-picture-signal processor according to claim 2 interpolation calculation of the hue conversion value of the corrected hue conversion value storage means is carried out and a hue value is calculated, even when an input color value from which the hue near the color which added correction changes slightly is given, it can prevent that a reappearance color changes rapidly.

[0048] Moreover, according to the color-picture-signal processor according to claim 3, since the storage capacity of a hue conversion value storage means is adjustable, the hue conversion value according to liking of a user is correctable to arbitration.

[0049] Moreover, since extent adjusted in the direction of a hue of the selected color is inputted according to the color-picture-signal processor according to claim 4, the adjustment of the color in alignment with sensibility of a user is attained.

[0050] Since the hue transfer characteristic is correctable based on selection with the color inputted from the 1st device, and the color reproduced with the 2nd device according to the color-picture-signal art according to claim 5, or he wishs, in the 2nd device, the color suitable for consciousness which is a user is easily reproducible.

[0051] Moreover, since according to the color-picture-signal art according to claim 6 interpolation calculation of the hue conversion value of the corrected hue conversion value storage means is carried out and a hue value is calculated, even when an input color value from which the hue near the color which added correction changes slightly is given, it can prevent that a reappearance color changes rapidly.

[0052] Moreover, since extent adjusted in the direction of a hue of the selected color is inputted according to the color-picture-signal art according to claim 7, the adjustment of the color in alignment with sensibility of a user is attained.

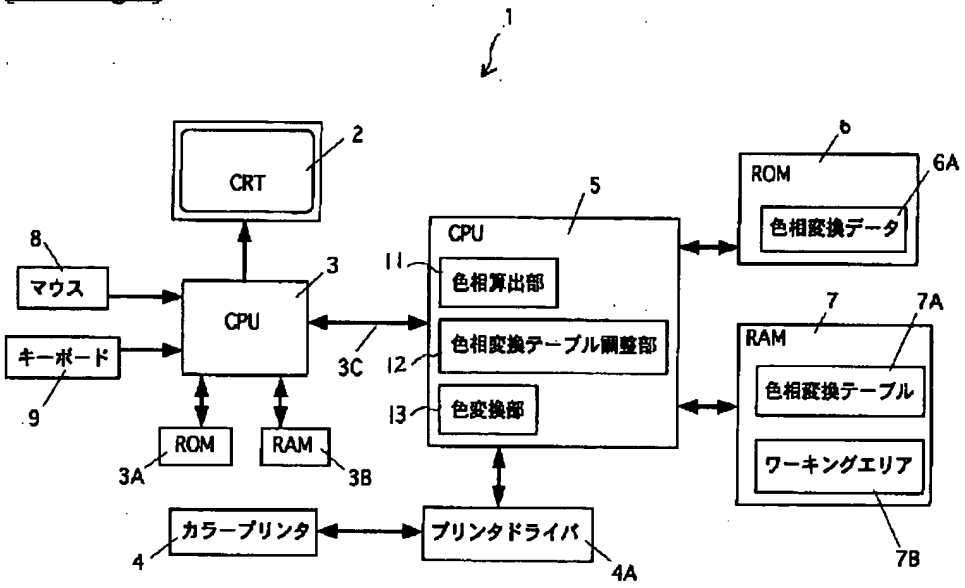
[Translation done.]

* NOTICES *

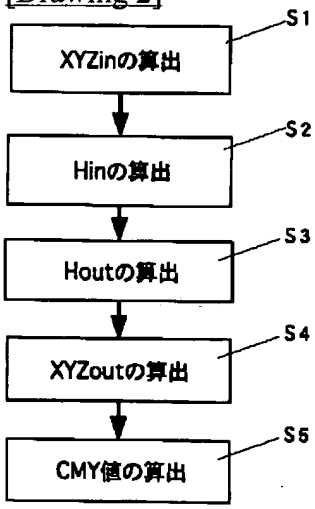
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

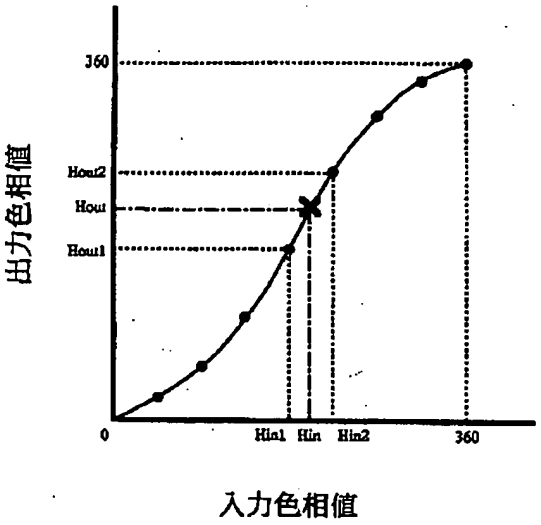
[Drawing 1]



[Drawing 2]



[Drawing 3]



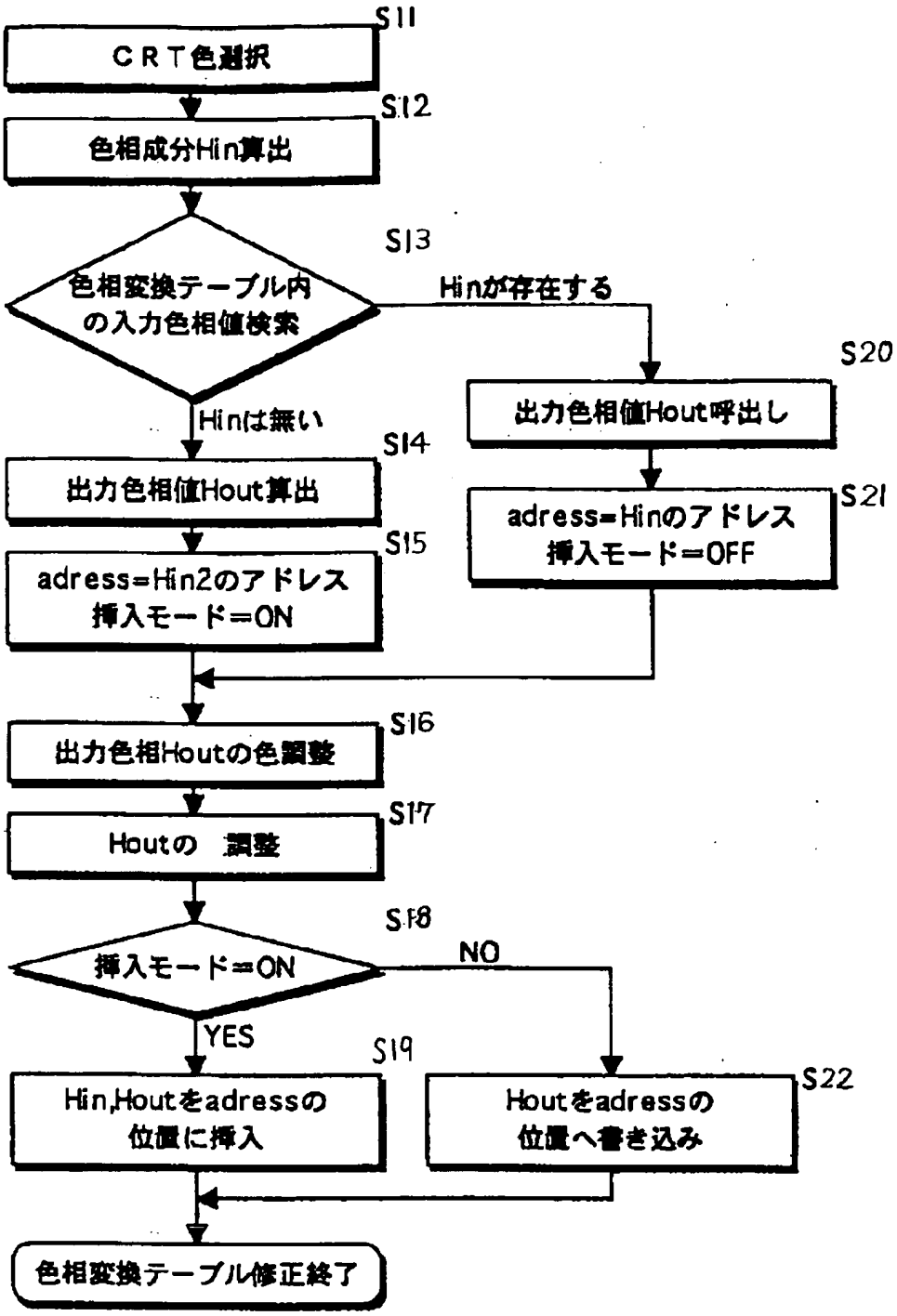
[Drawing 4]

アドレス	0		2n	2(n+1)		last-2
入力色相値	0		Hin1	Hin2		360
出力色相値	0		Hout1	Hout2		360

[Drawing 5]

アドレス	0		2n	2(n+1)	2(n+2)		last-2
入力色相値	0		Hin1	Hin	Hin2		360
出力色相値	0		Hout1	Hout	Hout2		360

[Drawing 6]



[Translation done.]